

Job Risk Analysis																			
Name(s) of Risk Team Members: J. Scott, S. Gill, Jack Barry				Point Value → Parameter ↓		1		2		3		4		5					
Job Title: Vacuum System Work Job Number or Job Identifier: JRA 10-05				Frequency (B)		≤once/year		≤once/month		≤once/week		≤once/shift		>once/shift					
Job Description: Set up and Testing Residual Gas Analyzers				Severity (C)		First Aid Only		Medical Treatment		Lost Time		Partial Disability		Death or Permanent Disability					
Training and Procedures List (optional): See Vacuum Group procedures				Likelihood (D)		Extremely Unlikely		Unlikely		Possible		Probable		Multiple					
Approved by: <i>E. Lessard</i> Date: 6-3-05 Rev. #:0																			
Stressors (if applicable, please list all): None				Reason for Revision (if applicable):Yearly Update, and Different Job Analyzed						Comments:									
				Before Additional Controls										After Additional Controls					
Job Step / Task	Hazard	Control(s)	Stressors Y/N	# of People A	Frequency B	Severity C	Likelihood D	Risk* AxBxCxD	Control(s) Added to Reduce Risk	Stressors Y/N	# of People A	Frequency B	Severity C	Likelihood D	Risk* AxBxCxD	% Risk Reduction			
Equipment Setup (Moving heavy equipment in shop)	Overexertion – injuries caused by excessive lifting, pushing, pulling, holding, or carrying of an object	Equipment on wheels, lift gate on step van, back safety training, use of squat lift technique, use of team lift, use of mechanical devices to assist in lift	N	2	2	3	3	36	Ergonomics in Mechanical and Industrial Work training is now available online. This course is for individuals who work with tools and equipment in a benchtop setting and who perform mechanical and industrial-type operations work. Strongly recommended for individuals who have experienced pain or injury from work-related ergonomic factors.	N	2	2	3	2	24	25%			
Equipment Setup (Slip on floor or wet surfaces in shop)	Falls on same level	Slip resistant footwear (e.g., steel toe sneakers), housekeeping rules, work planning	N	2	2	4	3	48	C-AD Housekeeping Policy and OPM 1.7, Supervisory Practice for Working with Hazards were enhanced to reinforce C-AD commitment to housekeeping practices. Supervisors were reminded to have their respective personnel read the OPM. In addition, C-AD Senior Management involvement in Tier I Inspections has focused on Building Manager responsibilities concerning housekeeping issues.	N	2	2	4	2	32	38%			

Equipment Setup(Lifting or pushing equipment into place and bolting together)	Bodily reaction – injuries resulting from bending, climbing, loss of balance and slipping without falling	Use of dollies to eliminate manual material handling tasks, use of portable lighting to increase visibility at job site, ergonomic reviews of work, effective supervision at the job site, training, work planning	N	2	2	3	3	36								
Equipment Setup (Climbing on equipment)	Falls to lower level, such as falling from a ladder or over a railing	Fall protection for work above 4 feet, training, selecting the right ladder for the job, inspecting the ladder, climbing and descending the ladder properly, work planning, ESHG review of scaffolding when used	N	2	2	4	2	32								
Equipment Setup (Temporary lighting stands can fall over, equipment on wheels can roll into people)	Being struck by an object, such as a tool falling on a worker from above	Hardhats, safety glasses, wheel locks, work planning , chocking, barriers	N	2	2	3	2	24								
Equipment Setup (Removing heating tapes from boxes and applying them to beam line)	Fiberglass dust from heater tapes	Ventilation of the work area, gloves and tight fitting clothing to help prevent skin exposure problems by reducing direct contact with glass fibers, dust masks to help prevent or reduce the inhalation of small fiberglass particles, goggles that fit properly to prevent eye irritation.	N	2	2	2	4	24								
Equipment Setup (Contact with energized conductors in ion pumps, transformers, power distribution circuits)	Electrocution	Electrical safety training, written procedures for setting up transformers and heating elements; equipment meets UL or equivalent testing standards, PPE as required, Barriers , postings as required, NFPE 70 guidance	N	2	2	5	2	40	See Notes 1 through 4	N	2	2	4	2	32	20%
Turbo Vacuum Pump operation	Pressurized System (Vacuum)	Training, procedures, instrumentation, ventilated or open areas for exhaust, leak checks as you draw vacuum, PPE, venting paths if required	N	2	2	3	3	36								
Set up cleaning and leak check	Chemicals	PPE, CMS, training, procedures, limited amounts, labeling, proper containers.	N	2	2	2	3	24								
Bake Out (Contact with temporary task lighting, contact with heating elements)	Contact with temperature – extremes that result in such injuries as heat exhaustion, frost bite or burns	Heating blankets and foil cover the heating elements, posted signs that state “Bake Out In Progress”, computer control and interlocks of system.	N	2	2	2	3	24								
Bake Out (Working in Radiation Area)	Ionizing radiation exposure	Work planning, use of time, distance and shielding to reduce exposure, ALARA review of high dose jobs, RWP, HP coverage as required.	N	2	2	1	2	8								
Equipment Setup and Bake Out	Being struck against an object - cuts and skin abrasions from working in tight spaces	Knee and elbow pads, steel-toe shoes, gloves, work clothing, ergonomic reviews of work.	N	2	2	3	3	36								
Returning set up to atmospheric pressure after testing	Pressurized system(vacuum)	Training, procedures, PPE, Venting gas(nitrogen), instrumentation.	N	2	2	3	3	36								

Moving and using pressurized cylinders	Dropping, missile	Training, proper moving carts, PPE, proper lifting rigs, SBMS guidance, proper regulators, proper storage	N	2	2	4	2	32								
Moving and using cryogenic dewar	Burns	Training, PPE, cryogenic safety review committee, procedures, equipment maintenance	N	2	2	3	3	36								
<p>Further Description of Controls Added to Reduce Risk:</p> <p>NOTE 1: OSHA Teams visited C-AD during the period October 20 through October 31, 2003 and recorded electrical non-compliances. All OSHA findings will be closed by 2006 by full compliance or with an equivalent level of safety.. The status of the OSHA items are maintained in BNL’s Compliance suite, and closed on a schedule commensurate with funding.</p> <p>NOTE 2: A compliance plan to have all electrical installations accepted by an Authority Having Jurisdiction (AHJ), as per 29CFR1910 Subpart S, has been implemented by BNL. UL, CSA, LLC or other NRTL accepted equipment will be acquired at BNL for all future installations. Prior installations shall be reviewed and accepted by qualified AHJs. The plan must be completed by 2009.</p> <p>NOTE 3: Full compliance with NFPA 70E was adopted by the C-AD in December 2005. NFPA 70E prescribes protective clothing to protect against shock and arc blast; thus reducing the severity and likelihood of an injury. It also prescribes training, which is currently fulfilled by taking the 2005 version of Electrical Safety 1 and by attending the C-AD 3-hour classroom course on electrical safety rules and PPE.</p> <p>NOTE 4: Contractor and vendor training in work planning and electrical safety has been improved. Plans to reach all contractors and vendors with regard to NFPA 70E requirements prior to performing work at BNL have been implemented. C-AD has obtained lists of all its vendors and suppliers and is ensuring that they take Electrical Safety 1 or have equivalent training if needed.</p>																
*Risk:	0 to 20		21 to 40			41-60			61 to 80			81 or greater				
	Negligible		Acceptable			Moderate			Substantial			Intolerable				